modeling performance attributes of a plurality of different components which may be used in said communications network;

specifying components from said plurality of different components to be used in said communications network;

specifying locations within said physical space for a plurality of different components in said computerized model; and

predicting a performance metric for said communications network which factors in said different objects, said performance metric being selected from the group consisting of throughput, error rates, packet latency, packet jitter, symbol jitter, quality of service, security, coverage area, bandwidth, bit error rate, packet error rate, frame error rate, round trip time, dropped packet rate, queuing delay, capacity, signal level, interference level, bandwidth delay product, handoff delay time, signal-to-interface ratio, signal-to-noise ratio, physical equipment price, and [installation] cost information.

2. The method of claim 1 wherein said computerized model generated in said generating step includes objects which create noise or interference, said noise or interference being an attribute of said object which is factored in said predicting step.

3. The method of claim 1 wherein said performance metric predicted in said [performing] predicting step is predicted in a forward direction in said communication network.

4. The method of claim 1 wherein said performance metric predicted in said [performing] predicting step is predicted in a reverse direction in said communication network.

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9. A method for designing, deploying [and] or optimizing a communications

network, comprising the steps of:

generating a computerized model of a physical space, said physical space having a plurality of different objects therein each of which has attributes which impact performance of a communications network;

modeling performance attributes of a plurality of different components which may be used in said communications network;

specifying components from said plurality of different components to be used in said communications network;

specifying locations within said physical space for a plurality of different components in said computerized model;

predicting a performance metric for said communications network; and

using a table look up to relate empirically measured network performance metrics to a predicted performance metric.

10. The method of claim 9 wherein said performance metric is selected from the group consisting of throughput, error rates, packet latency, packet jitter, symbol jitter, quality of service, security, coverage area, bandwidth, bit error rate, packet error rate, frame error rate, dropped packet rate, queuing delay, capacity, signal level, interference level, round trip time, bandwidth delay product, handoff delay time, signal-to-interface ratio, signal-to-noise ratio, physical equipment price, and [installation] cost information.

11. A method for designing, deploying [and] or optimizing a communications network, comprising the steps of:

generating a computerized model of a physical space, said physical space having a plurality of different objects therein each of which has attributes which impact performance of a communications network;

modeling performance attributes of a plurality of different components which may be used in said communications network;

specifying components from said plurality of different components to be used in said communications network;

specifying locations within said physical space for a plurality of different components in said computerized model;

using a table look up of empirically measured network performance metrics to [predict] provide or generate a prediction of a performance metric.

12. A method for analyzing a communications network, comprising the steps of:

generating a computerized model of a communications network within a physical space in which said communications network is or will be deployed, said computerized model identifying locations within said physical space of components used in said communications network, said computerized model having modeled attributes for each of said components;

positioning data collection measurement devices within said physical space;

identifying locations within said computerized model which correspond to said measurement devices;

measuring field measurement data with said data collection measurement devices; and

predicting a performance metric for said communications network based on said field measurement data, said modeled attributes for said components, and said locations of said components within said computerized model.

13. The method of claim 12 wherein said computerized model is three dimensional.

14. The method of claim 12 wherein said data collection measurement

devices used in said positioning step are portable.

15. The method of claim 12 wherein said positioning step includes of the step of affixing said data collection measurement devices permanently within said physical space.

16. The method of claim 12 wherein said performance metric predicted in said predicting step is selected from the group consisting of throughput, error rates, packet latency, packet jitter, symbol jitter, quality of service, security, coverage area, bandwidth, bit error rate, packet error rate, frame error rate, dropped packet rate, queuing delay, round trip time, capacity, signal level, interference level, bandwidth delay product, handoff delay time, signal-to-interface ratio, signal-to-noise ratio, physical equipment price, and cost information.

17. The method of claim 12 wherein said step of measuring is performed manually.

18. The method of claim 12 wherein said step of measuring is performed autonomously.

19. The method of claim 12 further comprising the step of storing said field measurement data.

20. The method of claim 12 further comprising the step of updating said computerized model generated in said generating step.

21. The method of claim 20 wherein said step of updating includes the steps of:

specifying components from a plurality of different modeled components which are to be used in said communications network, said modeled components including descriptions and attributes of a specific component; and

specifying locations within said physical space for a plurality of different components in said computerized model.

22. The method of claim 21 wherein said step of updating further includes the step of specifying an orientation for at least one component specified in said first specifying step at said location specified in said second specifying step.

23. The method of claim 12 wherein said computerized model in said generating step identifies orientations of said components at said locations within said physical space and said predicting step utilizes said orientations.

24. The method of claim 12 wherein said computerized model generated in said generating step includes objects which create noise or interference, said noise or interference being an attribute of said object which is factored in said predicting step.

25. The method of claim 12 wherein said performance metric predicted in said predicting step is predicted in a forward direction in said communication network.

26. The method of claim 12 wherein said performance metric predicted in said predicting step is predicted in a reverse direction in said communication network.

27. The method of claim 12 further comprising the step of specifying data transfer protocol, and wherein said predicting step uses a specified data transfer protocol as a factor in predicting said performance metric.

28. The method of claim 12 further comprising the step of specifying a network loading for said communications network, and wherein said predicting step uses a specified network loading in predicting said performance metric.

29. A system for analyzing a communications network, comprising:

a computerized model which shows a communications network within a physical space in which said communications network is or will be deployed, said computerized model identifying locations within said physical space of components used in said communications network, said computerized model having modeled attributes for each of said components;

data collection measurement devices positioned within said physical space, said data collection measurement devices being represented within said computerized model at locations that correspond to said data collection measurement devices, said data collection measurement devices measuring field measurement data for said physical space; and

means for predicting a performance metric for said communications network based on said field measurement data, said modeled attributes for said components, and said locations of said components within said computerized model.

30. The system of claim 29 wherein said computerized model is three dimensional.

31. The system of claim 29 wherein said data collection measurement

devices are portable.

32. The system of claim 29 wherein said data collection measurement devices are permanently affixed at said locations within said physical space.

33. The system of claim 29 wherein said performance metric predicted by said means for predicting is selected from the group consisting of throughput, error rates, packet latency, packet jitter, symbol jitter, quality of service, security, coverage area, bandwidth, bit error rate, packet error rate, frame error rate, dropped packet rate, queuing delay, round trip time, capacity, signal level, interference level, bandwidth delay product, handoff delay time, signal-to-interface ratio, signal-to-noise ratio, physical equipment price, cost information.

a3 Cont.

34. The system of claim 29 further comprising a means for storing said field measurement data.

35. The system of claim 29 wherein said computerized model is stored on at least one server.

36. The system of claim 35 wherein said computerized model is stored on a plurality of servers, said plurality of servers can communicate with each other.

37. The system of claim 36 wherein said plurality of servers have a heirarchical relationship to one another in said system.

38. The system of claim 35 further comprising at least one portable client device, said at least one portable client device can communicate with said at

least one server.

39. The system of claim 37 wherein said system includes a plurality of portable client devices.

40. A method for analyzing a communications network, comprising the steps of:

generating a computerized model of a communications network within a physical space in which said communications network is or will be deployed, said computerized model identifying locations within said physical space of a plurality of components used in said communications network, said computerized model having modeled attributes for each of said components;

predicting propagation delay information for said communications network based on said computerized model; and

outputting, storing or displaying said propagation delay information.

41. The method of claim 40 wherein at least some of said plurality of components that are modeled in said generating step are used in wireless communications, and wherein said predicting step factors in multipath delay attributable to placement of said components which are used in wireless communications.

42. A method for analyzing a communications network, comprising the steps of:

generating a computerized model of a communications network within a physical space in which said communications network is or will be deployed, said computerized model identifying locations within said physical space of a plurality of components used in said communications network,

said computerized model having modeled attributes for each of said components;

predicting a performance metric for said communications network based on said computerized model, said performance metric being selected from the group consisting of frame error rate, bit error rate, and packet error rate;

outputting, storing or displaying said performance metric.

43. The method of claim 42 wherein at least some of said plurality of components that are modeled in said generating step are used in wireless communications, and wherein said predicting step factors in multipath delay attributable to placement of said components which are used in wireless communications.

44. A method for analyzing a communications network, comprising the steps of:

generating a computerized model of a communications network within a physical space in which said communications network is or will be deployed, said computerized model identifying locations within said physical space of a plurality of components used in said communications network, said computerized model having modeled attributes for each of said components;

predicting at least one of round trip time and bandwidth delay product information for said communications network based on said computerized model; and

outputting, storing or displaying said at least one of round trip time and bandwidth delay product information.

45. The method of claim 44 wherein at least some of said plurality of

components that are modeled in said generating step are used in wireless communications, and wherein said predicting step factors in multipath delay attributable to placement of said components which are used in wireless communications.

46. A method for analyzing a communications network, comprising the steps of:

generating a computerized model of a communications network within a physical space in which said communications network is or will be deployed, said computerized model identifying locations within said physical space of a plurality of components used in said communications network, said computerized model having modeled attributes for each of said components;

predicting throughput of network information for said communications network based on said computerized model; and

outputting, storing or displaying said throughput of network information.

47. The method of claim 46 wherein at least some of said plurality of components that are modeled in said generating step are used in wireless communications, and wherein said predicting step factors in multipath delay attributable to placement of said components which are used in wireless communications.

48. A system for analyzing a communications network, comprising:

a computerized model which shows a communications network within a physical space in which said communications network is or will be deployed, said computerized model identifying locations within said physical space of components used in said communications network, said

computerized model having modeled attributes for each of said components;

means for predicting a performance metric selected from the group consisting of propagation delay information, bit error rate, frame error rate, packet error rate, bandwidth delay product, quality of service and throughput of network, said means for predicting making predictions based on said computerized model;

means for outputting, storing or displaying said performance metric.

49. The system of claim 48 wherein said means for predicting predicts propagation delay information.

50. The system of claim 48 wherein said means for predicting predicts bit error rate.

51. The system of claim 48 wherein said means for predicting predicts frame error rate.

52. The system of claim 48 wherein said means for predicting predicts packet error rate.

53. The system of claim 48 wherein said means for predicting predicts at least one of round trip time and bandwidth delay product.

54. The system of claim 48 wherein said means for predicting predicts throughput of network.

55. The system of claim 48 wherein said means for predicting predicts quality of service information.

56. A method for designing, deploying or optimizing a communications network, comprising the steps of:

generating a computerized model of a space, said space having a plurality of different objects therein each of which has attributes which impact performance of a communications network;

modeling performance attributes of a plurality of different components which may be used in said communications network;

specifying components from said plurality of different components to be used in said communications network;

specifying locations within said space for a plurality of different components in said computerized model;

using a table look up of predicted or preset performance metrics to provide or generate a prediction of a performance metric.

57. A method for analyzing a communications network, comprising the steps of:

generating a computerized model of a communications network within a physical space in which said communications network is or will be deployed, said computerized model identifying locations within said physical space of components used in said communications network, said computerized model having modeled attributes for each of said components;

identifying locations within said computerized model which correspond to said measurement devices;

downloading or inputting files of field measurement data; and

predicting or providing a performance metric for said communications network based on said field measurement data, said modeled attributes for said components, and said locations of said components within said computerized model.

58. The method of claim 57 wherein said field measurement data obtained in said downloading or inputting step is specific for said physical space.

59. A method for analyzing a communications network, comprising the steps of:

generating a computerized model of a communications network within a physical space in which said communications network is or will be deployed, said computerized model identifying locations within said physical space of a plurality of components used in said communications network, said computerized model having modeled attributes for each of said components;

predicting quality of service information for said communications network based on said computerized model; and

outputting, storing or displaying said quality of service information.

60. The method of claim 59 wherein at least some of said plurality of components that are modeled in said generating step are used in wireless communications, and wherein said predicting step factors in multipath delay attributable to placement of said components which are used in wireless communications.

REMARKS

Claims 1-4 and 9-11 have been amended and claims 12-60 have been added. Support for the claimed invention can be found throughout the specification.

Please proceed to Examination on the merits.

A check in the amount of $1578 is attached to satisfy the requirements for the additional claims. If any additional fees are required to gain entry of this amendment and consideration of these claims, the Commissioner is authorized to charge